

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (currently amended) A natural gas liquid plant, comprising:

a separator that is configured to allow separation of separates a cooled low pressure feed gas into a liquid portion and a vapor portion, wherein the liquid portion is reduced in pressure in and a first pressure reduction device that is configured to receive the liquid portion and to allow reduction of pressure of the liquid portion to provide, thereby providing refrigeration for a first cooler that is fluidly coupled to the separator and that is configured to allow cooling of ~~eeols~~ a low pressure feed gas to thereby allow formation of forming the cooled low pressure feed gas;

wherein at least part of the vapor portion is cooled in a second cooler and reduced in pressure in a second pressure reduction device fluidly coupled to the separator, wherein the second cooler is configured to allow cooling of at least part of the vapor portion, and wherein the second pressure reduction device is configured to reduce pressure of the part of the vapor portion to a degree effective to provide the part of the vapor portion to before entering an absorber as lean absorber reflux; and

wherein the absorber is configured to produce produces an absorber overhead product to thereby provide that provides refrigeration for the second cooler, and wherein the absorber is further configured to produce produces an absorber bottoms product, and that is fed into a demethanizer fluidly coupled to the absorber and configured to receive the absorber bottoms product as lean reflux.

2. (original) The natural gas liquid plant of claim 1 wherein the low pressure feed gas has a pressure of about 300 psig to about 1000 psig.
3. (currently amended) The natural gas liquid plant of claim 1 further comprising wherein a portion of the low pressure feed is cooled in a plurality of side reboilers that are thermally

coupled to the demethanizer and that are configured to cool a portion of the low pressure feed gas.

4. (currently amended) The natural gas liquid plant of claim 1 wherein the first pressure reduction device comprises a hydraulic turbine, and wherein the second pressure reduction device comprises a Joule-Thompson Joule-Thomson valve.
5. (currently amended) The natural gas liquid plant of claim 1 wherein the demethanizer is configured to receive the liquid portion that is reduced in pressure is fed into the as a demethanizer feed stream.
6. (currently amended) The natural gas liquid plant of claim 1 further comprising wherein part of the vapor portion is expanded in a turboexpander that is configured to allow expansion of part of the vapor portion, and further comprising fed into a second separator that is configured to receive the expanded part of the vapor portion and to produce that produces a liquid that is employed as a lean demethanizer reflux and a vapor that is fed into the absorber.
7. (original) The natural gas liquid plant of claim 1 wherein ethane recovery is at least 85 mol% and propane recovery is at least 99 mol%.
8. (canceled).
9. (currently amended) A natural gas liquid plant, comprising:

a primary and secondary cooler that are configured to cool a low pressure feed gas, and a separator that is configured to separate separates the cooled low pressure feed gas in a liquid portion and a vapor portion;

a first pressure reduction device that is configured to reduce reduces pressure of the liquid portion to and thereby provide provides refrigeration for the secondary cooler;

a third cooler that is configured to cool cools at least part of the vapor portion, and wherein the cooled vapor portion is expanded in a pressure reduction device that is configured to expand the cooled vapor portion; and

an absorber that is configured to receive receives the cooled and expanded vapor portion and to produce produces an overhead product that provides refrigeration for the third cooler and a bottom product that is employed as reflux in a demethanizer.

10. (original) The natural gas liquid plant of claim 9 wherein the low pressure feed gas is at least partially dehydrated and has a pressure of between about 300 psig and about 1000 psig.
11. (currently amended) The natural gas liquid plant of claim 9 wherein the first pressure reduction device comprises a hydraulic turbine and wherein the second pressure reduction device comprises a Joule-Thompson Joule-Thomson valve.
12. (currently amended) The natural gas liquid plant of claim 9 further comprising wherein a portion of the low pressure feed gas is cooled in a plurality of side reboilers that are thermally coupled to the demethanizer and that are configured to cool a portion of the low pressure feed gas.
13. (currently amended) The natural gas liquid plant of claim 9 further comprising wherein part of the vapor portion is expanded in a turboexpander that is configured to expand part of the vapor portion and fed into a second separator that is fluidly coupled to the turboexpander and that is configured to produce produces a liquid that is employed as a lean demethanizer reflux and a vapor that is fed into the absorber.
14. (currently amended) The natural gas liquid plant of claim 9 wherein the primary cooler is configured to employ employs as least one of external ethane, external propane, and the absorber overhead product as a refrigerant.
15. (original) The natural gas liquid plant of claim 9 wherein ethane recovery is at least 85 mol% and propane recovery is at least 99 mol%.
16. (currently amended) A natural gas liquid plant that comprises a separator that is configured to receive receiving a cooled low pressure feed gas and that is fluidly coupled to an absorber and a demethanizer, wherein the plant is further configured such that refrigeration duty of the absorber and demethanizer are provided at least in part by

expansion of a liquid portion of the cooled low pressure feed gas and an expansion of a vapor portion using a device other than a turboexpander, and wherein the demethanizer is configured to receive the expanded liquid portion as demethanizer feed.

17. (currently amended) The natural gas liquid plant of claim 16 further comprising a cooler that is configured to further cool wherein the cooled low pressure feed gas has been cooled by a cooler that employs using an expanded liquid portion of the cooled low pressure feed gas as [[s]] a refrigerant.
18. (currently amended) The natural gas liquid plant of claim 16 wherein the absorber is configured to produce produces an absorber bottom product that is fed to the demethanizer as reflux.
19. (currently amended) The natural gas liquid plant of claim 16 wherein the separator is configured to separate separates a vapor portion from the cooled low pressure feed gas and wherein a first part of the vapor portion is further cooled via a Joule-Thomson Joule-Thomson valve is configured to further cool a first part of the vapor portion for introduction and introduced into the absorber.
20. (currently amended) The natural gas liquid plant of claim 19 further comprising wherein a second part of the vapor portion is expanded and cooled in a turboexpander that is configured to expand and cool a second part of the vapor portion.